

Not to be taken
from drawer

Operating manual

for

Husqvarna

zig zag sewing machine

class 20



Manufactured by

Husqvarna-Väpnarfabriks Aktiebolag

Husvika

Sweden

Table of contents

Page	Page
APPLIQUE	INTRODUCTION
29	3
BAR TACKS	LACE
24	Attaching edging
BASTING STITCHES	28
18	Insertions
25	28
BLINDSTITCHING	MENDING
20	20
BOBBIN	MONOGRAMS
Inserting into bobbin case	19
13	NEEDLE
Winding	Inserting into machine
11	11
BOBBIN CASE	Selection of (chart of sizes) ..
Inserting into sewing hook	9
13	OILING
12	37
Removing from sewing hook ..	ORNAMENTAL SEAMS
12	18
Threading	OVERCASTING EDGES
12	23
BRAIDING	PREPARING MACHINE
28	6
BUTTONHOLES	PRESSER FOOT
Plain	Regulating Pressure
21	14
Corded	QUILTING
22	26
BUTTON SEWING	RUFFLING
23	30
CLEANING	SEWING
37	forward and reverse
27	16
CLOTH GUIDE	straight
15	17
COMMENCING TO SEW	zig-zag
15	18
CORDING	SHELL STITCHING
28	25
CORDING—DOUBLE NEEDLE ..	SHIRRING
35	36
CORNER TURNING	SPECIAL EQUIPMENT LIST ..
15	8
DARNING	STANDARD EQUIPMENT LIST
20	8
EMBROIDERY	STITCHES: regulating length of
19	16
EYELET EMBROIDERY	STRAW FOLDS
ATTACHMENT	33
35	THREAD, selection of
FEED DOG, lowering	10
17	THREAD TENSION, adjusting .
FELLING with hemmer foot	16
26	THREADING MACHINE
36	13
GATHERING	TROUBLES, causes and remedies
36	38
GETTING READY FOR	TWO NEEDLE ATTACHMENT
SEWING	33
15	ZIG-ZAG
HEMMING	Hemming
Narrow seams	25
24	Sewing
Rolled edges	18
24	Starting position
25	18
Shell stitch	ZIPPER; attaching
25	27
Zig-zag	
25	
HEMSTITCHING	
29	

Operating manual for Husqvarna zig zag sewing machine class 20

Introduction :

This manual has been prepared for the purpose of instructing you in the use and operation of your Husqvarna Zig Zag Sewing Machine. It is suggested that you familiarize yourself with these instructions. Study them carefully, because their knowledge will enable you to take fullest advantage of the many special features your machine has to offer.

As your machine represents a considerable investment, treat it with the care that is due any piece of precision made machinery. Neglect and careless handling will not only account for unsatisfactory results of your sewing, but will also shorten the service life of your machine.

The following instructions and your reference to the various illustrations will serve as a step by step guide to get you and your machine ready for sewing. Even after you have learned how to operate your machine, you will find this booklet a handy help in solving future sewing problems. It is, therefore, suggested that it be preserved carefully.

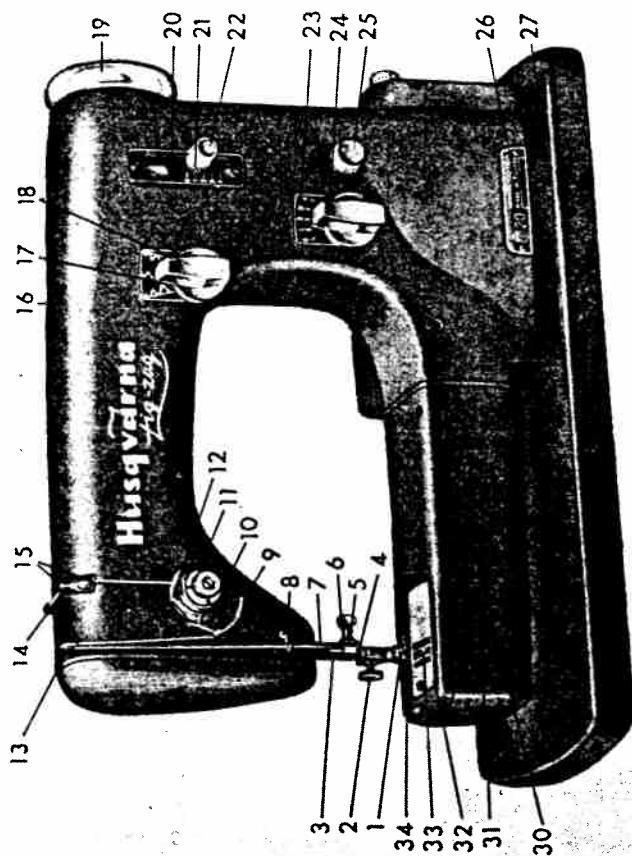


Fig. 1.

- | | |
|----------------------------|-------------------------------------|
| 1. Presser foot | 12. Take-up spring |
| 2. Presser foot screw | 13. Take-up lever |
| 3. Presser bar | 14. Thread guide |
| 4. Thread guide | 15. Thread guide |
| 5. Needle clamp | 16. Machine staff |
| 6. Needle set screw | 17. Scale for the starting position |
| 7. Needle bar | 18. Starting position knob |
| 8. Thread guide | 19. Handwheel |
| 9. Slash thread regulator | 20. Stitch regulator scale |
| 10. Tension disc | 21. Stitch regulator index |
| 11. Tension regulator knob | 22. Stitch regulator grip |

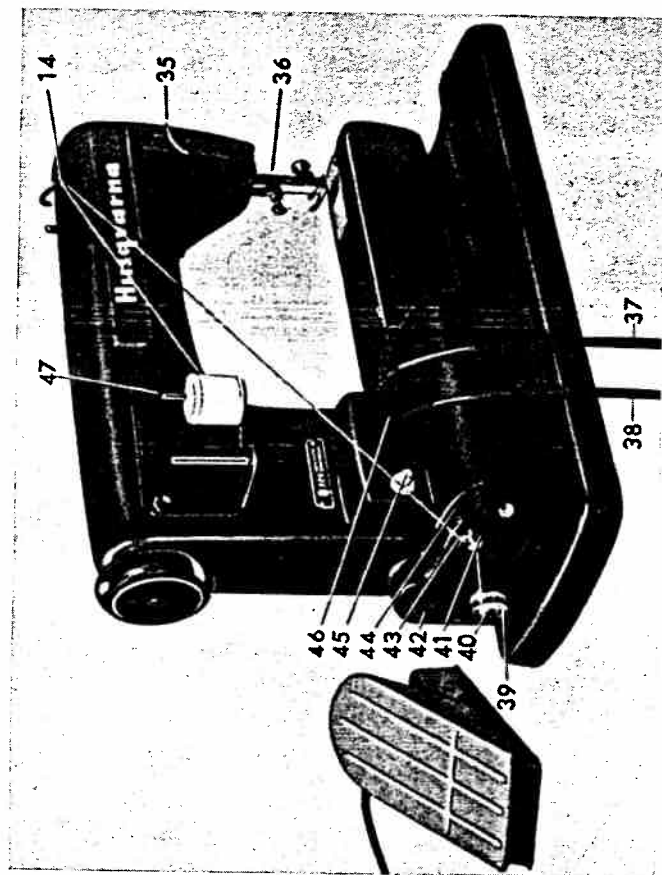


Fig. 2.

- | | |
|----------------------------------|--|
| 23. Zig-zag regulation scale | 37. Electric cord to the wall |
| 24. Zig-zag regulation knob | 38. Electric cord to the motor control |
| 25. Drop feed button | 39. Bobbin |
| 26. Scale for needle system etc. | 40. Spindle for bobbin winding |
| 27. Groundplate | 41. Tension discs |
| 30. Catch for the case | 42. Slow sewing |
| 31. Shuttle door | 43. Thread guide |
| 32. Needle plate | 44. Screw for tension arrangement |
| 33. Feed dog | 45. Breaker for the lamp |
| 34. Needle plate | 46. Plug |
| 35. Presser foot lifter | 47. Spool pin |
| 36. Knife for the thread | |

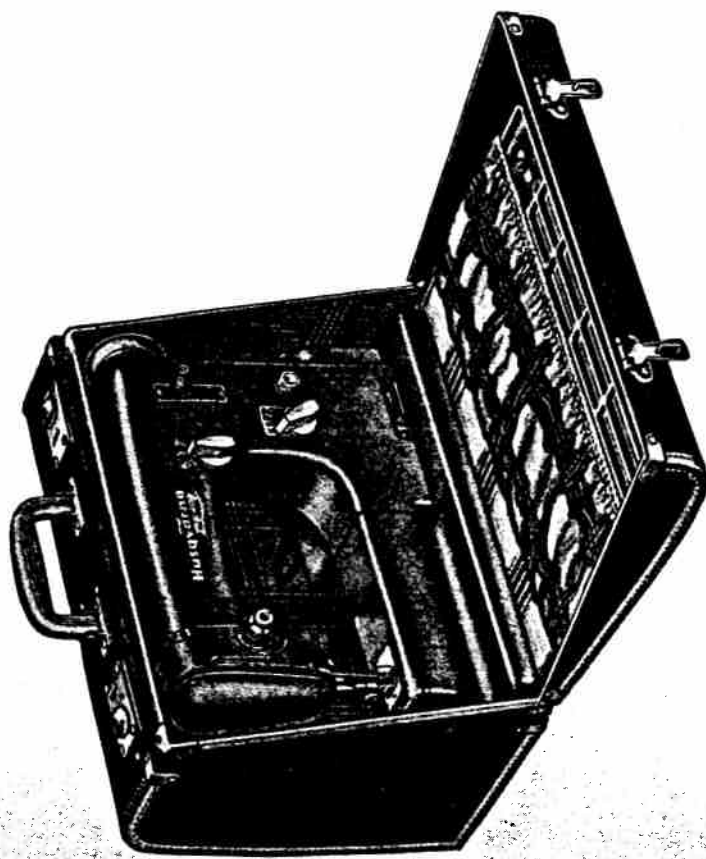


Fig. 3.

Preparing the machine for sewing

Lift machine out of its carrying case and place it in a convenient position near the edge of your sewing table.

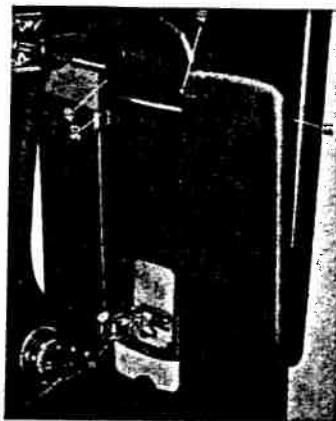


Fig. 4.

Take foot control out of its compartment in the carrying case. To facilitate the sewing of flat work, the extension plate can be installed on the machine. To secure this extension plate, slip open end into the free arm as shown in fig. 4. Guide fork (50) at underside of extension plate into pin (49) projecting from rear of free arm. At the same time pull bolt (48) on underside of extension plate near its right end and permit it to enter its seat hole (51) in the side of the arm. Finally, swing downward from the left end of the extension plate, the supporting leg. If necessary, screw in or out its ball shaped bottom in order to obtain the required support and also for the purpose of levelling the extension plate.

Before using your new machine give it a good cleaning and put one or two drops of light-bodied sewing

machine oil into each oil hole. The oilcan is a part of the accessories of your machine. Oiling instructions will be found on page 37.

Making the electrical connection

The machine is driven by an electric motor located in the back of the machine. This motor permits operation on AC and DC current. The speed of the machine is regulated by means of a motor control, foot operated, which is to be plugged to the motor (see fig. 2). Before plugging the electric cord, coming out from the machine, into your electric wall outlet, make certain that your house voltage corresponds to the voltage marked on the plate over the motor. Do not plug in unless they conform within 10 volts.

Note: When your sewing is completed, disconnect the electric cord of the sewing machine from outlet.

The lighting

The light can be put on and off by pressing the button 45 above the motor. (Fig. 2.) The bulb is placed in the arm of the machine and the light comes through a grating underneath the arm.

When changing bulb, disconnect first the electric cord. When opening the grating (fig. 5) the lamp slopes down and the bulb can easily be taken away. When the new bulb is



Fig. 5.

fixed push up the lamp and close the grating. The bulb has a bayonet socle and must therefore be pressed in and turned before taking it out.

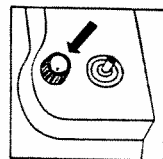
For certain operations the lamp is of more use in the turned down position (see fig. 5).

Slow stitching when embroidering

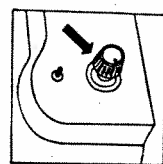
In order to obtain an exceptionally low speed, very easy to regulate, the button 42 to the right of the machine (fig. 6) can be removed (turn it so that the mark on the button comes up) and can then be placed on the bobbin spindle right below. This low speed should not, however, be used for ordinary stitching but only for embroidery work.



Fig. 6.



Plain sewing.



Extra slow sewing.

Fig. 7.

The button must always be inserted into some of these two positions, otherwise the motor will be damaged, if the current is connected.



Fig. 8.

Accessories and attachments

The machine is equipped with the following accessories:

S 15411 Box for attachments
S 15415 Oil can
S 15010 Cleaning brush
S 15399 Buttonhole knife
S 11729 Bobbin

3046 Screwdriver, small
S 15406 " large
Darning hoop
5 needles

1 twin needle
and the following standard attachments:

S 15229 Joint zig-zag presser foot (on the machine)
S 15395 Presser foot for zipper fastener

S 15428 Buttonhole foot
S 15237 Button foot
S 15103 Darning foot
3035 Hemmer, $\frac{3}{16}$ "

S 15236 Hemmer for roll seam
S 15419 Biesen foot with 3 grooves
S 15427 Plaiter for biesen seam

S 15423 Needle plate for $\frac{1}{8}$ " eyelets
S 15420 Edge guide
S 12111 Screw for attachments

The following attachments can be supplied upon request at extra cost

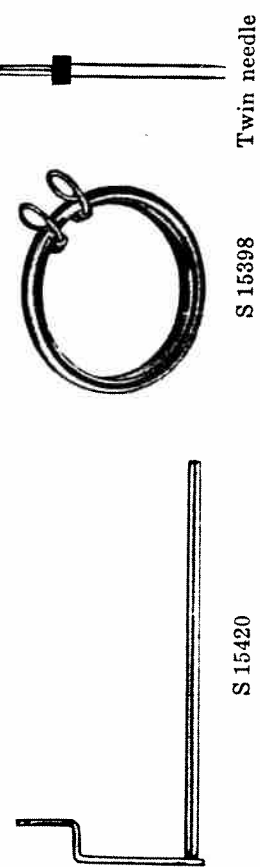
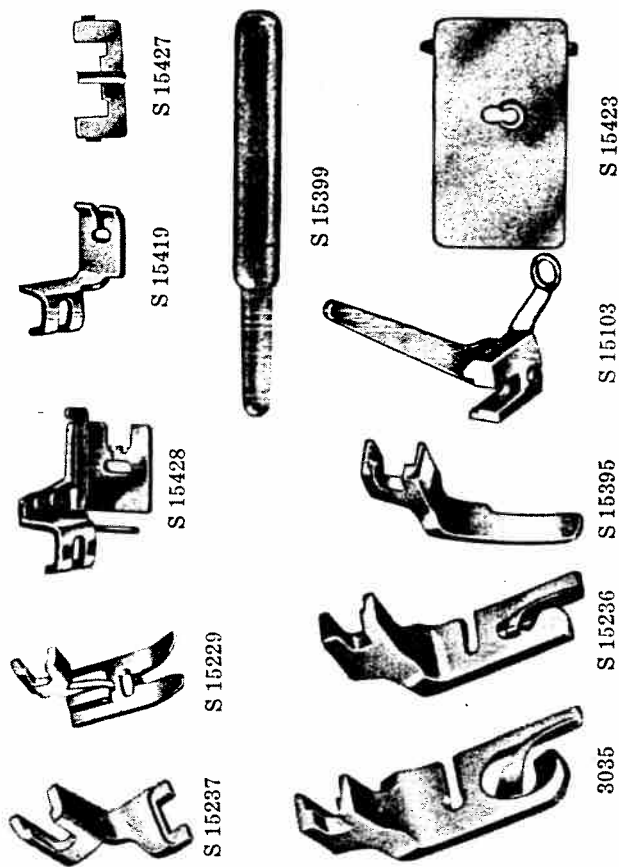
3020 Attachment for ruffling and quilting

S 15367 Hemstitcher
S 15432 Needle plate for $\frac{3}{16}$ " eyelets
S 15433 " " $\frac{7}{32}$ "
S 15426 Biesen presser foot with 1 groove

Twin needles with $\frac{3}{32}$ " needle distance
Twin needles with $\frac{1}{8}$ " needle distance
Twin needles with $\frac{5}{32}$ " needle distance

3019 Gathering foot
S 15150 Joint presser foot for straight seam
S 15232 Joint zig-zag presser foot with a cord hole

3002 Hemmer, $\frac{3}{32}$ "
S 15240 Hemmer for scalloping



Selecting the correct needles and thread

The seam produced by the sewing machine should blend with the fabric as much as possible except, of course, where contrast is desired. Consequently, the correct selection of needles and thread, matching the type of material you are sewing, is of importance.

Heavy goods require a thicker needle and coarser thread while sheer fabrics call for a fine needle and thin thread.

Needles system 705 must be used on class 20 for satisfactory operation. Do not substitute any other system. For permanent reference the correct system of needle is also indicated on the plate attached to the front of the arm of the machine.

Needle and thread selector

Sizes & grades of needles		Type of fabric and work to be done	Size of thread		
System 705			Cotton	Silk	Linen
Grades	Sizes				
Fine	60	Delicate fabrics like georgette, chiffon, batiste, fine lace, fine linen and other sheer fabrics. For fine lingerie, infants' clothes and fine lace work.	100 to 150	00 and 000 twist	
Medium-fine	70	Medium light-weight and summertime fabrics. For house dresses, children's dresses, cottons, aprons, curtains.	80 to 100	0 twist	
Medium	80	Dress silks and cottons, light weight to woolens and decorator's fabrics. For dressmaking and general household sewing, men's dress shirts and light weight draperies.	60 to 80	A & B twist	
Light-heavy	90	Heavy cretonne, madras, muslin, brocades and quilts. For men's work shirts and other work clothes, heavy quilting and decorators' articles.	40 to 60	C twist	
Medium-heavy	100—110	Heavy woolens and suiting, light weight canvas, bed ticking, upholstery and awning materials, slipcover fabrics. For men's suits, work and sports clothes awnings, slipcovers, upholstery and mattresses.	30 to 40	D twist	
Heavy	120	Heavy overcoating, duck, ticking, drills, canvas and sack-ing. For heavy washable uniforms, bedding for hospitals, hotels and camps. Extra heavy and coarse goods.	24 to 30	E twist	60 to 80
Extra-heavy	130	For canvas bags and heavy canvas products.	20 to 24		40 to 60

Inserting a new needle

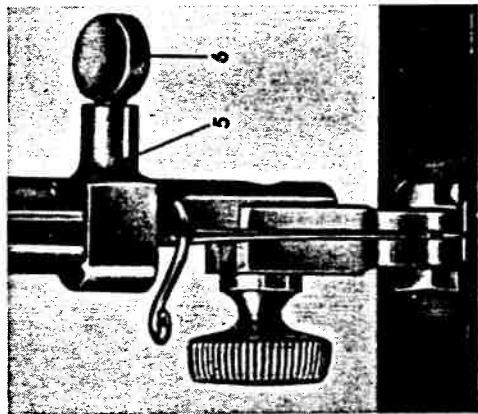


Fig. 9.

Turn handwheel toward you until the needle has reached the highest point of its course.

Loosen needle set screw (6) and pull out old needle. Insert new needle into needle clamp (5), pushing it up as far as it goes. Make sure that the flat side of the needle is turned against the needle bar, so that the long groove of the needle faces you. Tighten needle set screw (6) securely. Recheck whether needle is in-

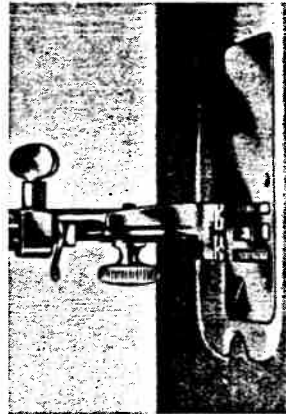


Fig. 10.

serted correctly. Needle's eye must face you as you sit in front of the machine (fig. 9).

When a twin-needle is used, this is inserted in the same manner (fig. 10).

Winding a bobbin

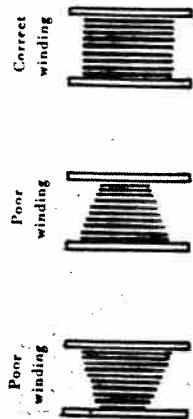
a. Place a spool of thread on the spool pin (47) nearest to the needle bar. Lead end of thread along the arm through wire guide (14) to thread guide (43) on the cover for the belt. Pull thread under the guide (43) and from left to right between the discs (41) of the tension device.

b. Wind the thread two or three times around the bobbin and push it onto bobbin winder spindle (39) as far as it will go. The sewing machine is then automatically stopped.

c. Start off the bobbinwinder by pressing pedal of motor control and keep it running at moderate speed until the bobbin is almost filled. In any case the bobbin should not be more filled than that it easily goes into the bobbin case. Stop machine and pull bobbin off the bobbin winder spindle (39). The sewing machine will then automatically operate again.

Note: Only an evenly wound bobbin will let the machine do the best stitching. Bobbins having thread piled up at one side should, therefore, be avoided.

To correct poor and uneven winding such as pictured on sample I, loosen screw (44) holding tension device and move it slightly to the left. Tighten screw and continue winding which now will be found improved. Piled up threads as seen on sample II can be avoided by moving tension device to the right. Sample III shows a bobbin wound correctly.



Removing the bobbin case from the sewing hook.

Turn handwheel (19) (fig. 1) toward you until the needle bar (7) reaches its highest point. Open the shuttle door (31).

Take out the bobbin case with the thumb and forefinger (fig. 11). Then the latch (1) (fig. 12) is pressed in. As long as the latch is pressed in the bobbin is retained in its case. On releasing the latch and turning the bobbin case downward, the bobbin drops out.

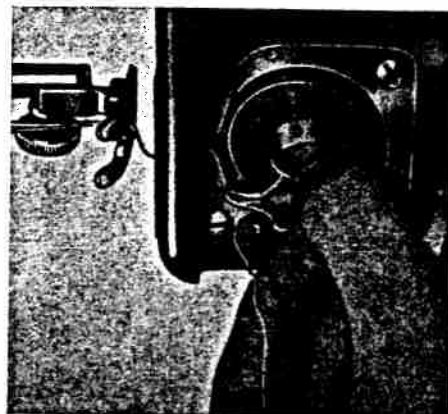


Fig. 11.

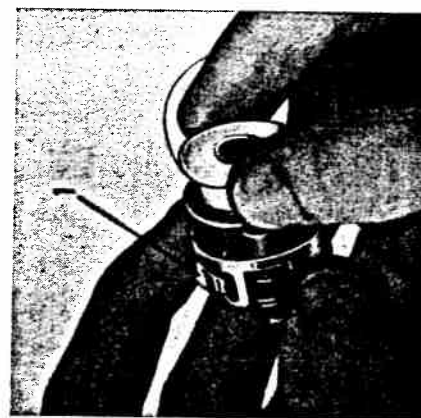


Fig. 13.

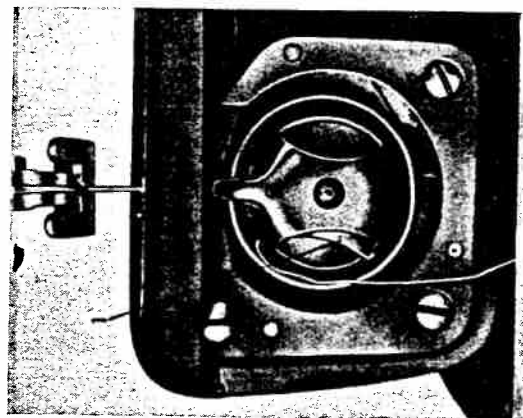


Fig. 12.

Threading the bobbin case

a. Hold bobbin case in your left hand with slot in edge of shell upward or facing you (fig. 13). Grasp the bobbin with your right hand, so that the thread on top leads from

left to right. Drop bobbin into bobbin case (fig. 14).
b. Using the right hand, draw the thread into the slot in the edge of the bobbin case, as shown in fig. 15.
c. Now pull the thread under the tension spring (fig. 15) and let it come out in the middle of the bent tab at the tip of the spring over the small hole in the bobbin case. (Fig. 15.)



Fig. 14.



Fig. 15.

Inserting the bobbin case with bobbin

Turn handwheel toward you until needle reaches its highest point. Open shuttle door (31) (fig. 1). Take bobbin case with same grip as employed in removing it and place it on the centerpost (fig. 16) of the hook with the semi-circular notch facing upward. Control that the bobbin case can not be pushed further against the hook. Pull bobbin thread 3—4 inches to hang down freely.

Threading the machine

Bring thread take-up lever (13) (fig. 17) to its highest position by turning handwheel toward you. Place a spool of thread on a spool pin of the spool holder. Pass the thread through the holes in thread guides 14 and 15 (fig. 17). Pull it downward to tension discs (10) and around them from right to left. Guide it upward and to the left over the crotch of the thread take-up spring (12), then

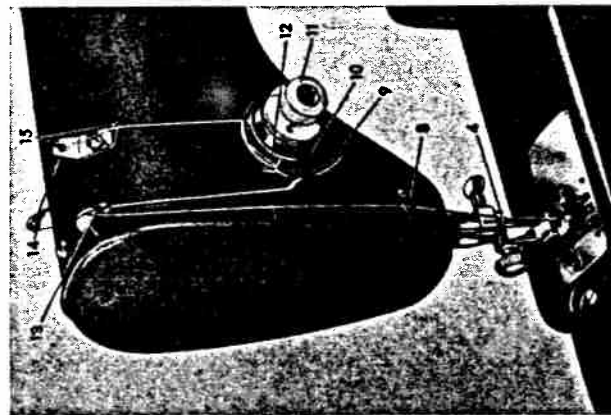


Fig. 17.

The presser foot

To permit the machine to stitch properly and to feed the material (past the needle), the presser foot (1) must be down on the material. Presser foot lifter (35) controls the raising and lowering of the presser foot (fig. 18).

Regulating the pressure of the presser foot: Turn regulator wheel (32) (fig. 18) to the right for more pressure and to the left to reduce it. When sewing heavier material, stronger pressure of the presser foot is often desired. Thin cloth usually requires reduced pressure of the presser foot.

Changing the presser foot: Many of the various operations possible with class 20 require the use of the special presser feet included in the attachments of the machine.

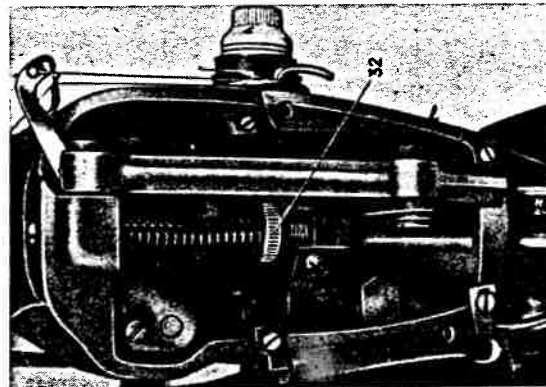


Fig. 18.

down again and from right to left around the underside of slack thread regulator (9). From there lead the thread upward to the eyes at the tip of the thread take-up lever (13) and through same from right to left, downward through thread guide (8) and the thread guide in the needle clamp (4). The thread is then passed through the eye of the needle from front to back. Pull 3—4 inches of thread through the eye of the needle.

When the machine is provided with a double needle, the machine is likewise threaded as described above with the second thread through the other hole in the take-up lever.

Note: Once threaded, do not run machine unless there is cloth between the presser foot and the needle plate and the presser foot is let down.

To exchange presser foot:

- Turn handwheel toward you until needle is at its highest point.
- Lift presser foot as described above.
- Loosen thumb screw (2) fig. 1 about three turns.
- Push presser foot downward from its seat on the presser bar. Tilt the bottom of the foot to the left and remove the foot.
- To install a different presser foot, slide its channel-like portion at the top against the presser bar and tighten thumb screw (2).

Getting ready for sewing

a. Hold end of needle thread with left hand, so that thread remains slack and with right hand turn the hand wheel slowly toward you until the needle goes down and comes up again to its highest position. In so doing, the upper thread (needle thread) will catch the lower thread (bobbin thread).

b. Now draw up the upper thread and at the same time the lower thread will be pulled up through the stitch hole in the needle plate (see fig. 19).

c. Both thread ends must then be placed away from you underneath the presser foot. Now your machine is ready for sewing.

Commencing to sew

Take some material, place it between presser foot and needle plate and lower the presser foot. Move foot control in convenient position when machine is so equipped. Turn handwheel toward you and at the same time apply slight pressure with your foot on the pedal of the foot

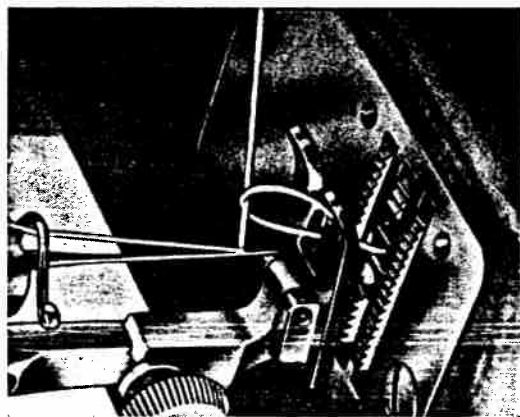


Fig. 19.

control. Once the machine is in motion, proceed with sewing as desired.

Note: Do not try to help feeding action of machine by pulling goods from behind needle nor hold back material to slow up the speed of the machine. Both actions may bend or break the needle and may also result in damage to other working parts of your machine.

Turning a corner

To turn a corner, stop machine where corner is desired, leaving needle in material. Lift presser foot and revolve material around needle as required. Lower presser foot and continue sewing.

Regulating the length of stitches

The length of the stitches is regulated with handle (22) (fig. 20).

The pointer (21) indicates on the scale the length of the stitch. The movement of the handle is arrested for each length of stitch by the wheel. When the wheel is turned to the left the handle can be pushed downwards and the stitch will be longer.

Sewing forward and reverse

When the handle is below the centre, the material is fed away from the person sewing. If the handle is moved upwards the material will be fed towards the person sewing.

Sewing in reverse is possible regardless of the length of stitch selected. The rapid reversal of the direction of sewing is particularly valuable when tacking at the end of seams.

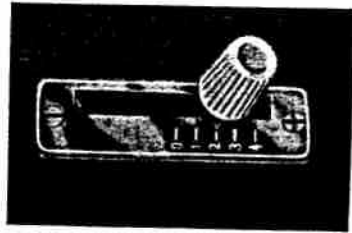


Fig. 20.

Removing the work from the machine

Stop machine. Turn handwheel toward you until needle is at its highest point. Raise presser foot by means of presser foot lifter. Draw the material directly back from the needle (away from you). Pull out about 4-5 inches and cut threads.

Adjusting the thread tension

Correct tension of needle thread (upper thread) and bobbin thread (lower thread) can easily be determined as follows:

When the tensions of upper and lower thread are properly adjusted, the stitches will look alike on both sides of the material, as shown in fig. 21 and no correction is necessary.

If tension of upper thread is too tight or tension of lower thread too loose, the upper thread will lie stretched out on top of the material and the lower thread will be drawn up to the top, appearing there in form of small knots (see fig. 22).

To correct this, first make certain that the presser foot is let down.



Fig. 21.



Fig. 22.



Fig. 23.

Then turn tension regulator knob (11), fig. 1, to the left. The figures and the stripes on the tension regulator knob will be found helpful in adjusting the tension, as they will indicate initial positions of the knob and make it possible to select a special tension for a certain thread.

Make several stitches to see if the upper thread tension is correct. If not, adjust further by turning regulator knob to the left.

If tension of upper thread is too loose or tension of lower thread too tight, the lower thread will lie stretched out along the underside of the

material and the upper thread will be drawn down to the underside, appearing there in the form of small knots or loops (fig. 23).

To correct this, first make sure that the presser foot is let down, then turn tension regulator knob (11) (fig. 1) to the right.

Make a few stitches to see whether tension is correct. If not, make further adjustments by turning the regulator knob to the right.

If at all possible, always regulate tension by adjusting upper tension. The lower tension should not be regulated unless absolutely essential,



Fig. 24.

as this adjustment is more delicate. In case you consider it necessary to adjust the lower tension, remove bobbin case from the machine. Turn bobbin case spring screw, fig. 24, to the right to tighten lower thread tension. If the tension is to be lessened, turn this screw to the left.

Note: Do not turn bobbin case spring screw more than about $\frac{1}{4}$ turn at a time in either direction. Then try and check for results.

Lowering the feed dog:

(Drop feed for darning and embroidery).

For the purpose of darning and embroidering the feed dog (33) fig. 1 can be lowered, so that the work can be fed by hand in any desired direction.

To effect this, turn the wheel 25 to the right a half revolution so long it will go. Then the mark on the wheel will be downwards. The feeding mechanism will be put back into operation if the wheel is turned to the left a half revolution so long it will go.

Straight sewing

The machine will make a plane straight stitch when the zig-zag regulator knob (24), fig. 25, points at marking "O" at extreme left of dial.



Fig. 25.

Zig-zag sewing

Setting the zig-zag regulating knob, fig. 25, to any other dial marking but "O", will produce a zig-zag stitch. The width of this zig-zag stitch can be varied at will up to a maximum of 4 mm when the regulator knob is set at dial marking "4".

Basting stitches

Regulate the length of stitches until indicator (21) points at marking

"4". Slightly loosen needle thread tension by turning tension regulator knob (11) to the left. The machine will produce a long, loose stitch which can be pulled out readily.

Note: The zig-zag regulating knob (24) can be moved into any desired position while the machine is operating. Do not turn zig-zag regulating knob when machine is at rest and needle is in material. Disregard of this advice may have bent or broken needle as a consequence. Raise needle from material before operating knob.

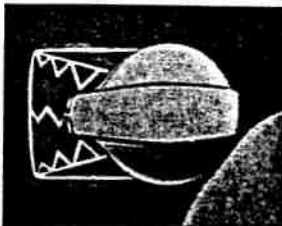


Fig. 26.

Starting position for zig-zag sewing: Ordinarily the starting position knob (18), in the "central" position of the dial as seen on the illustration. With the knob in this position, the machine will make zig-zag stitches which are central relative to the straight seam, see fig. 27.



Fig. 27.

With the starting position knob in the "left" position, the machine will produce zig-zag stitches which are to the right of the straight seam, as shown in fig. 28.

Zig-zag stitches which are to the left of the straight seam, as pictured in fig. 29, will be sewn when the starting position knob is in the "right" position.

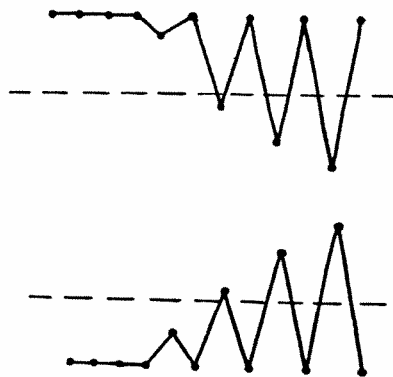


Fig. 28.

Fig. 29.

Ornamental seams

A wide variety of ornamental seams (fig. 30, 31) can be made by suitable choice of the width and length of the zig-zag stitch combined

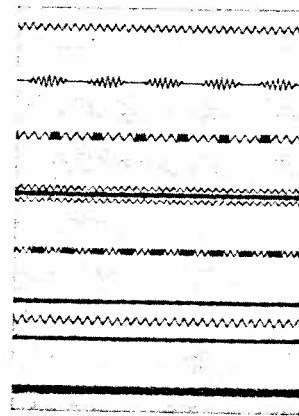


Fig. 30.

Embroidery and monograms

Remove presser foot from presser bar (fig. 32). Lower feed dog by turning drop feed button (25) in accordance with instructions on page 17. Thread machine with embroidery thread of a type intended for sewing machines (silk or mercerized thread). Stretch design to be embroidered or monogrammed over an embroidery hoop and place under needle. Let



Fig. 32.

with a properly selected starting position of the needle. The appearance of such seams can be further enhanced by using colored thread.

In addition to the ornamental seams described in the preceding chapter, your own imagination will help you to produce many other pleasing patterns. With the foot S 15237 fig. 35 it is possible to sew curved seams. They lend themselves admirably to decorating garments, furnishings, pillows, doilies, etc.

down presser foot lifter. Get machine started slowly, turning handwheel by hand for the first stitch or so to bring up the bobbin (lower) thread. Holding both bobbin and needle thread, start outlining contour of design with fine stitches. (see fig. 32, 33 and 34).

Set zig-zag stitch regulator knob (page 17) to desired width of stitch and start filling in the design with rows of stitches. Guide hoop slowly

back and forth under the needle and operate machine at an easily controllable speed. After an even padding has been obtained, cover with a straight satin stitch to give the appearance of hand work.

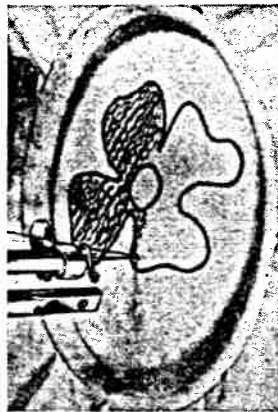


Fig. 33.



Fig. 34.

Darning and mending

Prepare machine for this work by removing the presser foot from the presser bar (3), attaching instead the darning presser foot (fig. 36). At the same time make sure that the long arm on the darning presser foot comes behind the cylindrical body of the needle set screw (6).

Drop feed dog by turning drop feed wheel (25). Set starting position knob



Fig. 35.

(18) at "central" needle position and move zig-zag regulating knob (24) to "O".

Use suitable embroidery darning thread of a type intended for sewing machines. Stretch article to be darned in an embroidery hoop and place under darning foot. Lower foot upon the material close to the spot where turn and begin sewing. Cover bear with successive rows of stitches mo-



Fig. 36.

ving article back and forth slowly. Turn article and sew further rows of stitches across those first made. Continue sewing until hole is covered completely.

While small holes may be darned by holding down the fabric with one's fingers, the use of an embroidery hoop is recommended for closing larger holes.

Sewing buttonholes

1. For the making of all types of buttonholes the machine requires the following preparation:

- Remove regular presser foot and install buttonhole presser foot (fig. 37).
- Turn starting position knob (18) to "left" needle position (page 18).
- Move zig-zag regulating knob (24) to marking 2 mm on dial.



Fig. 37.

D. Adjust stitch regulator knob (22), so that indicator finger above it points to a spot between dial marking "0" and "1" but closer to "0". (With stitch regulator in this setting,



Fig. 38.

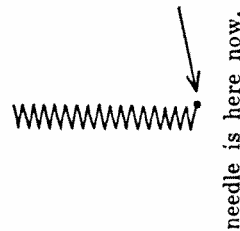
machine should produce closely spaced purl stitches.)

E. Adjust gage on buttonhole presser foot (fig. 38) to indicate required length of buttonhole. To determine this adjustment, measure size of button and add approximately $\frac{3}{16}$ " to $\frac{1}{4}$ ". The distance from the needle of the machine to the front of the gage should equal this measurement.

F. Thread machine same as for ordinary sewing (page 13). Tighten thread tension by turning tension regulating knob (11) about $\frac{1}{4}$ to $\frac{1}{2}$ turn to the right (page 18) to obtain the desired purl stitch effect. To determine the appearance of the buttonhole stitch, sew a row of purl stitches on a scrap of the material which is to have the buttonholes.

2. The actual sewing of the buttonhole calls for this sequence:

- Mark off length of buttonhole on garment.
- Place start of buttonhole under needle and have its end face you. Let down presser foot and begin sewing. Stop when first row of stitches reaches the gage.
- Turn handwheel toward you until needle makes another right hand stitch. Leave needle in material. What you have sewn up to now should look like this diagram:



needle is here now.

D. Raise presser foot slightly and turn garment clockwise around the needle. The diagram below represents what you should see now:

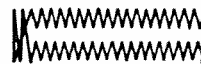


Lower presser foot and turn handwheel toward you until needle is above material.

E. Turn zig-zag regulating knob (24) to marking "4" on dial. Make 3 to 4 stitches to sew first closing bar and stop machine with needle out of material. The half finished buttonhole will have an appearance as illustrated on this diagram:



F. While needle is out of fabric, return zig-zag regulating knob (24) to dial marking "2". Now sew second line of purl stitches. Stop machine with needle out of material. Here is how the almost finished buttonhole will look:



G. Move zig-zag regulating knob to dial marking "4" and sew 3-4 stitches to complete second closing bar.

The diagram below pictures what the finished buttonhole will be like:



H. Turn handwheel toward you until needle is out of material. Move zig-zag regulating knob (24) to "0" on dial. Turn drop feed button (25) and sew 2 or 3 straight stitches to lock threads.

I. Insert the cutter at one end of the buttonhole and carefully cut material between the two rows of purl stitches.

Note: It is advisable to make one or two sample buttonholes on a scrap of material, same as your garment. If required, make necessary adjustments to obtain desired results.

Corded buttonholes

In soft woollens and, more generally, in all garments where the buttonholes are subject to extensive wear, a corded buttonhole with gimp inserted is preferable.

The method of making corded buttonholes is the same as employed in making plain buttonholes, except that there is no need for a particularly tight upper (needle) thread tension. It is recommended that corded buttonholes be started from the in-

side of the garment, working toward the edge. The inserted gimp will then round that end of the buttonhole where the stress is greatest and will increase its durability.

Sewing on buttons

Raise needle to highest position by turning handwheel toward you. Remove regular presser foot and attach button sewing foot to presser bar (fig. 39).

Drop feed dog by turning drop feed button (25). Set starting position knob (18) for "left" needle position

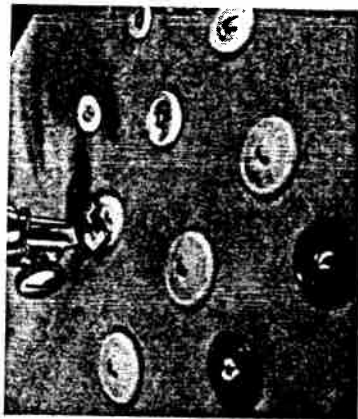


Fig. 39.

(page 18). Turn zig-zag regulating knob (24) to marking "3 1/2" on dial.

Place garment with button under button sewing foot. Line up holes in button with oblong stitch hole in foot and lower same. Carefully and slowly turn handwheel toward you and check whether needle passes through center of left hole in button. Continue turning handwheel and watch needle enter the right hole in button. If needle does not pass through center of hole, but to the left, turn zig-zag regulating knob (24) to the right. Conversely, if needle should stitch to the right of the hole, turn zig-zag regulating knob (24) to the left.

Having made certain that the

needle clears the respective holes in the button, sew 5-6 stitches at an easily controllable speed.

Stop machine with needle out of the button and return zig-zag regulating knob to dial setting "0". Make an additional 3 or 4 straight stitches in left hole of button to lock threads.

When attaching four-hole buttons, first sew one set of holes as described above. Lift presser foot and shift garment to get second set of holes lined up for sewing. Lock threads with 3 plain stitches, same as done with two-hole buttons.

On buttons with four holes decorative designs, such as pictured, can easily be sewn by suitable placing the button under the button sewing foot and by proper adjustment of the zig-zag stitch.

Overcasting edge

The edges of the material can easily be secured against fraying by overcasting them with a zig-zag stitch (fig. 40).

Use hinged zig-zag presser foot and set zig-zag regulating knob (24) to marking "2" on dial. Adjust length of stitch by setting stitch regulator index (21) on marking "2".

Place edge to be overcast under presser foot, so that needle on its right stroke just clears the material.

When overcasting loosely woven material, set both zig-zag and stitch regulators on respective markings "3 1/2".

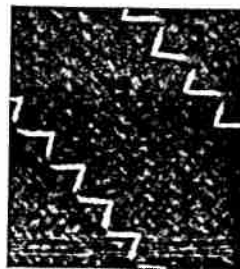


Fig. 40.

Making bar tacks

Bar tacks (fig. 41), such as used for reinforcing the ends of pockets, etc., can be made after adjusting the machine as follows



Fig. 41.

Set zig-zag regulating knob (24) on "1½" and set stitch index (21) to "½". Sew tacks, having an appearance similar to a buttonhole purl stitch, about ½ inch long, across seams at either end of pocket. When tack is completed and needle above the material, return zig-zag regulating knob to "0" and, pressing down drop feed button, sew 2—3 stitches to lock threads.



Fig. 42.



Fig. 43.

Narrow hemming — rolled edges

Remove presser foot from presser bar and attach narrow hemmer foot (part 3035, or if light material rather 3002). See fig. 42 and 43.

Set needle position regulator in "central" position and zig-zag regulating knob on dial marking "0". Regulate length of stitch to correspond to the weight of the fabric used.

- Prepare fabric by clipping off corner where hemming is to start. Fold over edge about ⅛" for a length of 2" and insert this fold from underneath into the spiral shaped opening (scroll) at the tip of the foot.



Fig. 44.

- Carefully move material back and forth in scroll until hem forms itself. Then pull material toward you until start of hem is just below the needle.

- Lower presser foot and begin sewing. Guide material into scroll on hemmer foot as the sewing progresses.

During the hemming operation make sure that the material completely fills the scroll on the hemmer foot. Should the edge of the material show a tendency to leave the scroll, guide it more to the right. If too much material is fed into the scroll, it must be guided to the left to avoid crowding or doubling over.

Instead of straight stitches a zig-zag stitch can also be used to obtain narrow rolled edges (with the foot S-15236). Turn zig-zag regulating knob (24) to "3" and proceed as outlined above. See fig. 44.

Shell stitching

Install hemmer foot S-15240 (fig. 45) on presser bar of machine to produce this kind of stitch.

The stitch is most appropriate for



Fig. 45.

use on light weight fabrics, such as silk, rayon or nylon. The instruction given for "narrow hemming", page 24, should be followed with the exception that zig-zag regulating knob (24) is to be set at dial marking "4" and the tension of the upper (needle) thread is to be increased to obtain the shell stitch effect. Also use a rather long stitch to give the individual "shells" a wide spacing.

Zig-zag hemming

For sewing a hem, as shown on fig. 46, hemmer foot 3035 is used.

Install this foot on presser bar of machine and make all adjustments as outlined under the heading "narrow hemming". Set starting position knob to the right and zig-zag regulating knob (23) on "3". The appearance of the zig-zag seam can be enhanced by using thread of a different color. Incidentally, this hemmer can also be used for straight stitch hemming.



Fig. 46.

Blindstitching

By folding the material and adjusting the machine as described

below, a blind hem can be produced without the use of any attachment.

- a. Prepare and baste hem in same way as for hand hemming and turn garment inside out.
- b. Again fold over hem with right slides of material facing each other. Let seam binding project $\frac{1}{4}$ " beyond the edge of fold.
- c. Set zig-zag regulating knob (23) at dial marking 4 and set length of stitch likewise 4 — loosen upper thread tension.
- d. Place material under presser foot of machine, so that needle stitches alternately into edge of fold and into seam binding. Be sure that when stitching into edge of fold needle barely catches material (1 or 2 threads), so as to make the stitch as invisible as possible. (See fig. 47.)

Felled seams

The hemmer feet can also be used for doing felling. Proceed in the following manner:

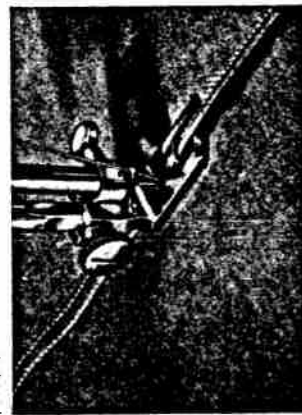


Fig. 48.

1. Lay two pieces of cloth one on top of the other with their right sides facing each other. The right edge of the bottom piece must extend about $\frac{1}{4}$ " beyond the right edge of the top piece. See fig. 48.

2. Sew both pieces of cloth together, using the hemmer foot like a regular presser foot. Use the right edge of long toe of hemmer foot to guide the bottom piece of material, while the left edge of the same toe serves as a guide for the top piece of material. Fig. 39 shows this detail.

3. Open and spread out material and put back on machine right sides downward. Make sewn edges of material stand up.

4. Fold over the edges to the left and insert them into the scroll of the hemmer foot. Sew as you would do ordinary hemming. Use left edge of long toe of hemmer foot as guide, having original seam run alongside of it.

Quilting

with quilting guide: Insert quilting guide from right to left or from left to right through hole in presser bar just above shank of presser foot. From the rear turn knurled thumb screw into screw hole in presser bar. Slide quilting guide in or out and set it to the desired distance from the needle.

Using either straight or zig-zag stitch, sew first line. To sew subsequent parallel lines, move fabric to right until curved bottom of quilting guide is right above preceding row or stitches. (Fig. 50 and 51.)

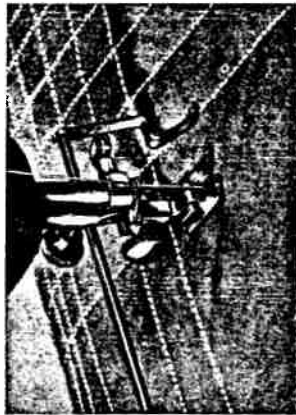


Fig. 50.



Fig. 51.

Cloth guide

Passing of the material along the adjustable guide will permit stitching parallel to an edge, such as pictured on fig. 52.

Fig. 53 shows sewing a cord, 54 sewing a spring, 55 sewing attaching zippers.



Fig. 52.



Fig. 55.

Cording and braiding

Remove zig-zag presser foot from machine and attach presser foot with cord hole S-15232 shown on fig. 56.



Fig. 56.

Introduce cord or gimp from front in cord hole and draw about 2—3 inches past foot. Set starting position knob (18), in central position. Adjust zig-zag regulating knob (24),

so that needle stitches into material at either side of cord. Regulate length of stitches, so that they become closely spaced. When braiding make widely spaced stitches to leave the cord visible.

For soutage (fig. 57) embroidery and braiding use zig-zag presser foot for zig-zag or straight stitches.



Fig. 57.

Attaching lace edging

Set starting position knob (18), in "central" position. Regulate width of zig-zag and length of stitch to suit the particular kind of fabric on which you are sewing.

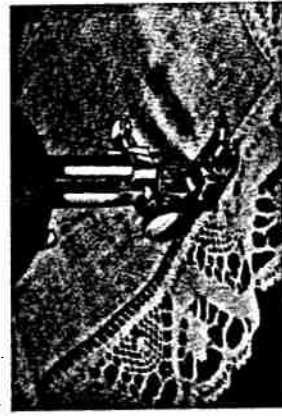


Fig. 58.

Turn cut edge of material under a trifle more than $\frac{1}{8}$ ". Place edge of lace closely against fold of material which should be centered under presser foot. Lower presser foot and start sewing, making sure that needle stitches alternately into material and lace.

Trim turned-under edge close to zig-zag stitches. (See fig. 58.)

Lace insertions

Prepare machine in same way as for attaching lace. Baste lace insertion onto right side of material. Using fine needle and thin thread, follow edge of insertions with short and narrow zig-zag stitches. Be sure that needle stitches alternately into material and into lace insertion. After insertion is completely attached, turn material over and trim to about $\frac{1}{8}$ " from edge. Roll back trimmed edge and stitch it down with short, straight stitches.

Applique

Flowers, initials and other decorations can effectively be appliqueed onto table cloths, pillows, bedthrows



Fig. 59.

and garments by first basting onto the article a piece of material on which the desired design has been outlined.

Adjust machine to sew closely spaced zig-zag stitches of about $\frac{1}{16}$ " to $\frac{3}{32}$ " width and place article under the presser foot. Align edge of design with center of presser foot. Start sewing, following the contour of the design. (See fig. 59 and 60.)



Fig. 60.

Rug making (Rya-technique)

When making rugs on the sewing machine, a so called weaver's reed is used, which is provided with a slot in the blade and a loop for locking the narrow part of the reed after the wool has been wound around it. Squared canvas or juste should be used as foundation.

The wool should be wound a few turns around the reed, but not too tight. The presser foot is lowered, and stitching takes place backwards and forwards over the wool through the slot in the reed. After this has been done, the loop is unclamped, the reed is pushed forward and more wool is wound on it. When the wool has been sewn on for the whole length of the reed it should be cut with a pair of scissors without, however, removing the work from the machine.



Fig. 61.

The sewing then continues, row upon row, until the required design is finished, when the threads are secured with stitching backwards and forwards. (See fig. 61.)

Hemstitching

Draw the desired number of threads from the material, as is customary when hemstitching by hand.

Prepare machine by adjusting length of stitch to suit the weight of the material. Use short stitches when sewing batiste, cottons, etc. When hemstitching coarser material, use a correspondingly larger stitch. Set zig-zag regulating knob (24) to dial marking "1". Starting position knob (18) remains in the "central" position.

Place material under presser foot and sew along one edge where the threads have been drawn. Be sure that needle stitches alternately into the solid material and into the space where the threads have been pulled. Upon completion of one edge, follow the same method to stitch the other edge.

By cutting along the center of the hemstitching, a PICOT (fig. 62) edge can be obtained.



Fig. 62.

Another method of producing a picot edge is to turn over the cut edge of the material and to sew along the fold with the needle stitching alternately inside and outside the goods. Set length of stitch to marking "1½" and turn zig-zag regulating knob to dial marking "2".

Operation of the ruffler

The ruffler, included with the attachments of the machine, will be found a convenient device for doing all kinds of ruffling, plaiting and gathering. To operate the ruffler, follow this procedure:

a. *Attaching the ruffler:* Turn handwheel toward you until needle is at highest position. Remove presser foot and also presser foot thumb screw. Slip fork arm "B" of ruffler (fig. 63) over needle set screw (6) extending from the needle clamp (5) to the right. At the same time enter foot "A" on presser bar (3). Reinsert presser foot thumb screw and tighten. Ascertain that starting position knob (18) is set at the "central" position and that zig-zag regulating knob (24) is turned to "0".

Carefully turn handwheel and check if needle passes through center of needle hole in ruffler foot. (See fig. 63.)

b. Description of ruffler:

- A — FOOT which is attached to presser bar.
- B — FORM ARM must be placed astride the needle clamp.
- C — ADJUSTING SCREW. Holds fullness of gathers or plaits.
- D — PROJECTION. Fits through slots in adjusting lever.
- E — ADJUSTING LEVER. Used to set the ruffler for gathers or plaits.
- F — POINTER. Determines size of plait or fullness of gathers.
- G — SEAM GUIDES. On ruffler separator.
- H — RUFFLING BLADE. The upper blue steel blade with teeth at end.
- J — SEPARATOR. The lower blue steel blade which prevents feed blade contacting feed of machine.
- K — DIAL has numbers from 1 to 8 which aid in setting fullness of ruffle.
- L — HEADING GUIDE can be adjusted for different size headings.
- M — LIP which separates seam guides.
- N — SLIDING GUIDE can be adjusted for different width seams or headings.

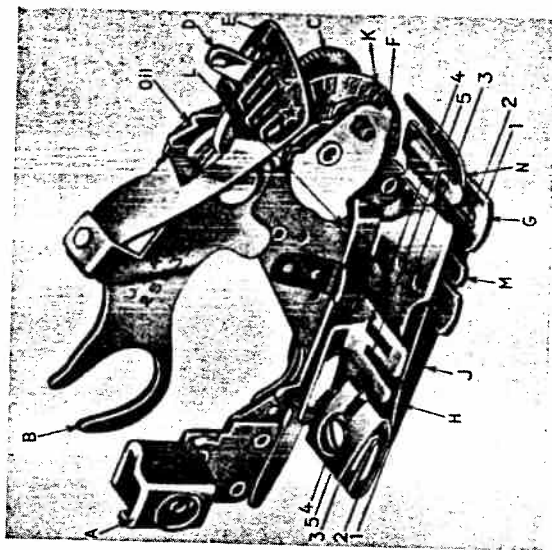


Fig. 63.

Line 1 — is under the ruffler and indicates the position for the garment to which ruffle is to be stitched giving a ¼ inch seam.

Line 2 — between the blue blades where the feed blade will gather or plait material with a ¼ inch seam.

Line 3 — the upper piece of material used when ruffle is enclosed between two pieces of material.

Line 4 — Guide for piping strip.

Line 5 — for edgestitching material to ruffle that is entered from right.

c. Gathering a ruffle:

The ruffler will make ruffling and plaiting in uniform fullness or, with simple adjustment, can be made to vary fullness of ruffle and accomplish grouping of plaits or gathers without removing ruffler from machine.



Fig. 64.

Slot 1 on adjusting lever "E" must always be over projection "D" for gathers, as shown in fig.

Place material to be gathered between the blue blades of the ruffler following line 2. Push forward until material is under the needle, lower presser bar and be ready to stitch.

To make a scant gather, put slot 1 on adjusting lever "E" over projection "D". Loosen adjusting screw "C" and set pointer "F" at figure 1 or 2 on dial "K". Tighten the adjusting screw "C" securely and test fullness of gathers.

By setting pointer "F" at different numbers, and changing the length of machine stitch, a variation from a scant to a full ruffle will result.

d. Plaiting a ruffle:

The widest plait is obtained when pointer "F" on dial "K" is as far forward as possible, away from you, number 8 on dial "K".

The set ruffler for plaiting, loosen adjusting screw "C" and set pointer "F" at 8 on dial "K". Tighten adjusting screw "C" securely.

Plaits can be stitched close, or far apart, by placing slot 6 or 12 in adjusting lever "E" over projection "D". For plaits set close together, place slot 6 over projection "D".



Fig. 65.

Place slot 12 over projection "D" for plaits stitched farther apart. Changing the stitch length on sewing machine will produce different spacings.

Plaits in groups can be accomplished with this ruffler. Set slot 6 on adjusting lever "E" over projection "D". Stitch, making the number of plaits desired in a group. Place slot with star on adjusting lever "E" over projection "D" and stitch without any action from the ruffler until desired space between groups is obtained. Place slot 6 on adjusting lever "E" over projection "D" for each successive group of plaits and place slot with star on projection "D" for each space.

e. Gathering material and sewing it to garment:

To gather and sew a ruffle to a garment in one operation, place material to be ruffled between the blue blades of the ruffler following line 2 and place garment to which ruffle is to be applied under the ruffler following line 1. To add a facing at the same time, place the facing on top of the blue blades following line 3.

To pipe and enclose ruffle in facing, place edge of facing under ruffler from left following line 1. Enter ruffle to be gathered between blue blades following line 2. Cut a decided point in piping that has been folded



Fig. 66.

and cut $\frac{1}{4}$ inch wide and enter it in piping guide "H" with fold of piping toward the left. Place garment over all, guiding its seam edge along the slide of ruffler. Turn facing to the wrong side and fasten to garment.

Sewing with twin-needle

1. The twin-needle number width 2 as standard attachment. (Twin needles of other dimensions are available at extra cost.)

When adapted for two-needle sewing, the Class 20, in addition to all possible straight and zig-zag stitching, will produce a variety of decorative plain or raised seams which lend themselves magnificently to use on dresses, linens, lingerie and other items.

Threading the machine for twin-needle sewing: To thread machine for two-needle operation follow the instructions on page 13. Note, however, that two spools of thread are required. Pass each thread through its own individual hole in the take-up lever (13). Run threads downward through the guides and thread the needles from front to back.

Twin-needle distance: The distance between twin-needles can be varied from 2 mm to 4 mm. When sewing thin material, use twin-needle with distance 2 mm. On heavier goods use twin-needle with greater needle distance.

Sewing "straw" folds (raised seam) with the twin-needle

a. Width and height of the "straw" folds depend primarily on the material used. Of course, they are also subject to style and individual taste. It is, therefore, recommended that a sample be made on a scrap of the same fabric before working on a garment. Furthermore, if the "straw" folds are to be made in different



Fig. 67.

directions, this should also be tried. The grain of some types of material will not allow the sewing of folds across or on a bias. For wider raised seams use attachment for raised seam shown in fig. 67.

Thin dressgoods — use size 70 needles closest needle distance 1.8 mm. Upper and lower thread tensions should be quite tight. Use presser foot with three narrow grooves at bottom.

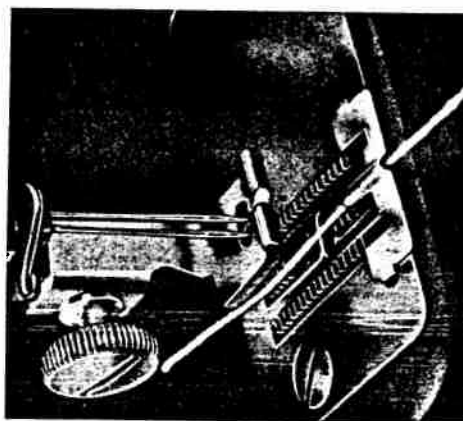


Fig. 68.

Heavier dress goods — use size 100 needles, 3 or 4 mm needle distance. Maintain normal thread tensions. Use presser foot with 3 grooves (fig. 68).

Light woolsens — use size 80 needles needle distance to suit weight of fabric. Maintain normal upper and lower thread tensions. Use presser foot with three narrow grooves.



Fig. 69.

Woolen suiting and coat material — use size 100 needles wide needle distance 4 mm. Maintain normal upper and lower thread tensions. Use presser foot with wide single groove at underside.

b. Parallel "straw" folds: The three grooves at the bottom of the



Fig. 70.



Fig. 71.

presser foot shown in fig. 69 can be used as guides to sew a parallel fold to one already made. Let the preceding fold "ride" in one of the grooves depending on the desired spacing and a whole group of folds can be spaced exactly alike (fig. 70).

Should a wider spacing of the folds be required than is possible with this presser foot, the quilting guide (fig. 71) may be used.

This guide is inserted through a hole in the presser bar about the presser foot shank and held in place by a knurled thumb screw which screws into the presser bar from the rear.

c. Sewing corners and angles: Leave the needles in the material and turn the material in the desired direction. Needles should preferably be on the upward stroke. When acute angles are to be sewn, it is advisable to first turn the material halfway, then make a single stitch and finally turn the material in the selected direction. Be sure at all times to use the needles as pivots and to leave them in the fabric.

d. Sewing curved seams: To sew raised double seams, pin pleats or "straw" folds in figures or curves, install the presser foot on the presser bar of the machine.

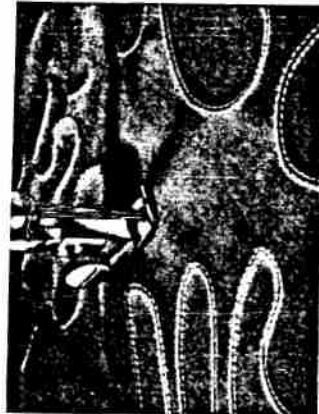


Fig. 72.

e. Sewing raised seams with cord insertion: Attach to presser bar the two needle presser foot with one wide groove. Furthermore the raised seam attachment, shown in fig. 72 must be attached to the needle plate.

Insert cord from front in hole of raised seam attachment. Place material under presser foot and when sewing a firm raised seam will appear.

Sewing in curves a beautiful fancy stitching can be done.

2. Eyelet embroidery attachment

With the aid of the eyelet embroidery attachment, the Class 20 permits the sewing of eyelets for embroidery, belts or lacing (fig. 73).

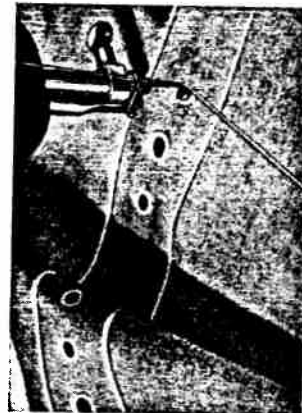


Fig. 73.

Eyelets can be made on nearly all types of fabric, those tightly woven and not excessively heavy being preferable.

The thread for sewing eyelets should be selected corresponding to the kind of material used.



Fig. 74.

For sewing eyelets prepare machine and work as follows:

- Remove presser foot from presser foot bar.
- Select eyelet embroidery cover plate with center stud matching the desired size of eyelet ($\frac{1}{8}$ ", $\frac{3}{16}$ " or $\frac{1}{4}$ " diameter, fig. 74) and place it on the needle plate.
- Set starting position knob (18) to "left" needle position. Turn handwheel of machine toward you, making sure that needle passes through center of stud in cover plate.
- Adjust zig-zag regulating knob (24) to marking "3" on dial. Needle, on right hand stitch, should enter material well past the edge of hole.
- Stretch material tightly over an embroidery hoop and cut holes with scissors, a bodkin or stiletto in material where marked. Holes should be made small enough to fit snugly over the center stud of the respective cover plates, as this will produce better looking and more uniform eyelet embroidery.

- f. Adjust thread tensions by slightly loosening the tension of the needle (upper) thread. Increase somewhat the tension of the bobbin (lower) thread to obtain a desirable appearance of the eyelet embroidery.
- g. Place the hole in material over center stud on cover plate. Turn handwheel toward you to pick up the bobbin thread, hold it and the needle thread down into the cloth when making the first few stitches.
- h. Start sewing, turning the embroidery hoop two to three times slowly and uniformly clockwise around the center stud in the cover plate. To lock the threads of the embroidered eyelet, re-turn zig-zag regulating knob to "O" and sew once around with straight stitches.
- i. Even out the complete eyelet by turning a bodkin (stiletto) in it a few times.

Shirring and gathering

Ordinary gathering is done with the zig-zag presser foot or the presser foot for straight sewing (fig. 75). In order to get even and attractive gathers:

1. Loosen the tension on the upper thread slightly.
2. Adjust the length of stitch to suit the material.
3. Stitch two or three rows with even spacing following inner guide or right edge of the zig-zag presser foot.
4. Then pull the under threads while easing the material into gathers.
5. When attaching gathers the gathered material is sewn on along one of the gathering threads.
6. In order to ensure even spacing between gathering threads use the straight-guide.

Gathering with shirring foot

Shirring and gathering can also be done conveniently with the shirring foot.

To do shirring and gathering, remove the regular presser foot from the presser bar and install the special shirring foot (fig. 76).



Fig. 75.

Be sure to set starting position knob (3) at "central" position and to turn zig-zag regulating knob (23) to marking "O" on dial before starting to sew.

To obtain maximum fullness of the gathers adjust machine to make long stitches and slightly tighten the upper (needle) thread tension.



Fig. 76.

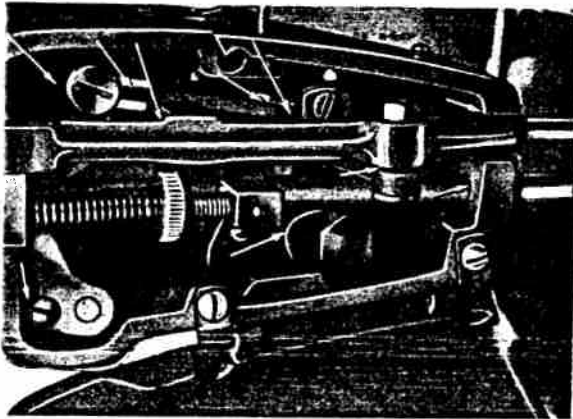


Fig. 77.

Oiling and cleaning the machine

Class 20 Sewing Machine, like any precision made piece of machinery, will always retain its smooth and silent operating qualities if it is properly attended to and oiled regularly.

The arrows on fig. 77 above indicate those oil holes on top of the machine which require weekly of a good grade of sewing machine oil. Should the machine be used at less frequent intervals, it must be oiled before starting to work. Do not oil machine excessively, as the oil will run off and soil the material.

Fig 78 shows the oil holes and spots to be lubricated when the arm-door has been opened.

Turn the arm back cover and give a drop of oil on the places shown in fig. 79.

After the machine has been oiled, wipe its top surfaces and sew a length of seam on a scrap of ma-

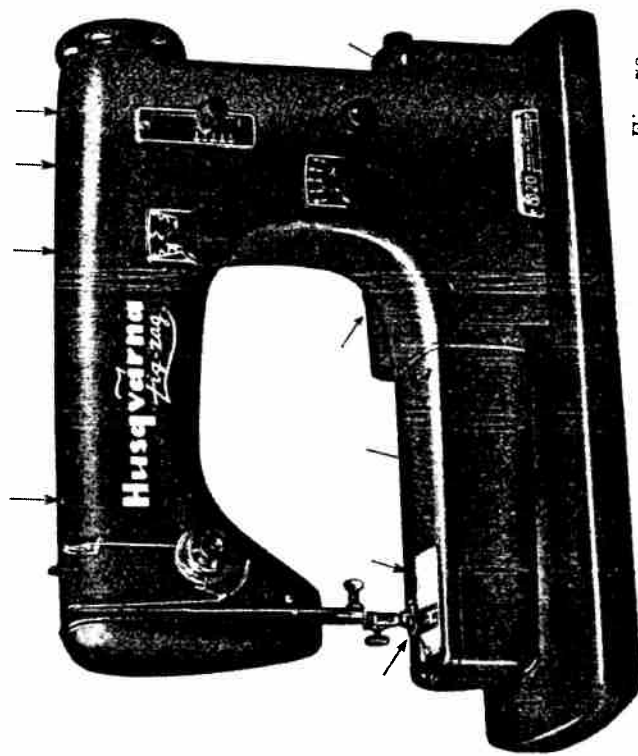


Fig. 78.

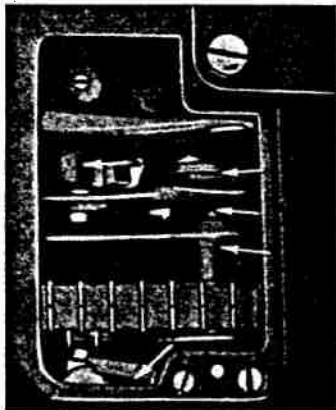


Fig. 79.

terial to make sure that the machine sews without soiling.
To clean machine, open face door and needle plate. Using the small



Fig. 80.

brush included with the set of attachments, remove all accumulations of loose threads, lint and fuzz from the exposed parts of the mechanism in the arm and from the teeth of the feed dog.

Causes of the most common sewing machine troubles and their remedies

Hard running of machine:

1. Motor belt too tight or has jumped off motor pulley or hand wheel.
2. Machine lubricated with unsuitable, gummy oil. Pour a few drops of kerosene into each oil hole and run machine for a few minutes. Then lubricate with proper sewing machine oil.

Machine not feeding properly:

1. Make sure stitch regulator knob (21) is not set on "O". (Refer to page 15 on "Regulating the Length of Stitches".)
2. Feed dog in dropped position. Raise feed dog pursuant to instructions contained in chapter on "Lowering Feed Dog", page 17.
3. Pressure of presser foot not sufficient. Increase pressure by turning regulator wheel (37)

8. Point of rotary sewing hook damaged. Have it repaired and repolished.

Bobbin thread breaks:

1. Bobbin case not inserted correctly (page 13).
2. Bobbin thread too tight (see page 17).
3. Bobbin wound unevenly.
4. Bobbin wound too fully.
5. Poor thread.
6. Stitch hole in needle plate rough or sharp. Repair or replace needle plate.

Bobbin thread cannot be pulled up:

1. Needle is inserted incorrectly (page 11).

Needle breaks:

1. Needle bent. Insert new needle.
2. Pulling material from behind needle while sewing. (Do not help machine feed material.)

Skipping stitches:

1. Needle bent or blunt. Insert new needle.
2. Needle inserted incorrectly. Refer to page 11.
3. Needle threaded improperly. See page 13.
4. Wrong size of needle used.
5. Thread too heavy for needle.
6. Pressure of presser foot insufficient, especially when sewing on heavy material. See page 14.

Loose stitches — loops on underside of material:

1. Machine not threaded correctly.
2. Presser foot not let down completely.
3. Insufficient tension of needle thread. See page 16.
4. Thread take-up spring (12), fig. 1, bent or broken. Repair or replace.

Poor stitches — bad looking seam:

1. Thread wound unevenly on bobbin. See page 11.
2. Upper thread tension too tight or too loose. See page 16.
3. Bobbin thread too coarse. Should be same as needle thread or even somewhat finer. Refer to Needle and Thread Selector, page 10.
4. Needle thread too coarse for material.
5. Needle not suited for material.
6. Needle point damaged.

Uneven thread tension:

1. Poor quality of thread.

Wrinkling of material:

1. Needle thread tension too tight.
2. Needle and bobbin thread tensions too tight for material used.
3. Presser foot pressure too great.
- Turn regulator bushing (32) to left (fig. 18).

Stitches of varying lengths:

1. Feed dog is clogged with lint. Clean it out.
2. Worn teeth in feed dog. Replace feed dog.

Loosely stitched seams:

1. Upper (needle) and lower (bobbin) thread tensions too loose. See page 16.

Cloth is chewed up:

1. Pressure on presser foot too tight. See page 14.

Important note

Do not try to repair the machine yourself if it fails to operate satisfactorily after having followed the abovementioned suggestions. Only your class 20 dealer, by virtue of his skill and experience, is qualified to service your machine competently and is able to maintain its outstanding performance.